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BOOK REVIEWS.

LOGIK. By *Dr. Christoph Sigwart.* Zweiter Band. Die Methodenlehre. Zweite durchgesehene und erweiterte Auflage. Freiburg i. B. and Leipsic: J. C. B. Mohr. 1893. Pp. 761. Price, 10 marks.

LOGIK. EINE UNTERSUCHUNG DER PRINCIPIEN DER ERKENNTNISS UND DER METHODEN WISSENSCHAFTLICHER FORSCHUNG. By *Wilhelm Wundt.* Erster Band. Erkenntnisslehre. Zweite umgearbeitete Auflage. Stuttgart: Ferdinand Enke. 1893. Pp. 651. Price, 14 marks.

"If one were to inspect," says Professor Adamson, "a fair proportion of the "more extensive recent works on logic, the conclusion drawn would be probably 'the same,—that, while the matters treated show a slight similarity, no more than "would naturally result from the fact that thought is the subject analysed, the diversity in mode of treatment is so great that it would be impossible to select by "comparison and criticism a certain body of theorems and methods, and assign to "them the title of logic. . . . In tone, in method, in aim, in fundamental principles, "in extent of field, they diverge so widely as to appear, not so many different expositions of the same science, but so many different sciences. In short, looking to the "chaotic state of logical text-books at the present time, one would be inclined to say "that there does not exist anywhere a recognised, currently received body of speculations to which the title logic can be unambiguously assigned, and that we must "therefore resign the hope of attaining by any empirical consideration of the received doctrine a precise determination of the nature and limits of logical theory."

In its modern form as theory of knowledge and methodology, logic embraces parts of nearly every philosophical discipline. In each investigator's hands it has assumed a form which accords with the author's predilections, being predominantly metaphysical, epistemological, psychological, mathematical, or linguistic, according as the processes of thought, in the aspects in which they are treated, are deemed to be better typified or illustrated by the one or the other of these points of view. While some treatises have laid special stress upon only one of these sides of mental activity, others, in the aspiration to be a complete compendium of the science, have sought to do justice to all, so that most of the works of this latter class have become rather epitomes of the results of the investigations of the special sciences than a study of the laws of thought and inquiry. Especially have these treatises neglected the discussion of the philosophical foundation of the laws of thought and inquiry, having restricted themselves almost exclusively to the exposition of the methods of science, as justified by results ; although such a discussion is absolutely indispensable to the determination of the scope and character of logic.

Two noteworthy exceptions to this error are the works of Sigwart and Wundt, although each has accomplished its task in a different measure and in a different manner, showing differences of point of view and of scientific training. Sigwart's treatment of the fundamental philosophical question is predominantly formal and metaphysical; Wundt's predominantly psychological. This difference is also noticeable in the second volumes of their works, which treat of methodology, where the investigations of Wundt are richly embellished by illustrations from all the positive sciences, while Sigwart is very meagre in historical illustrations. Both agree in their independence of tradition.

Professor Sigwart, to take his book first, was one of the first laborers in the field of modern logic, and of all the larger treatises on the subject his is perhaps the most economically and concisely worked out. We do not meet in his work with résumés of the special sciences nor with profuse criticisms of opposed opinions, but have simply an exposition of methods in a clear and general form permeated by unity of treatment and distinguished by perspicuity. Still the work is large enough. It consists of two indexed volumes, containing respectively four hundred and eighty-five and seven hundred and seventy-eight pages, published in 1873 and 1878. The first volume of the present edition, reviewed in *The Open Court* of 1889, No. 107, appeared in 1888; the second in 1893. It was thus, we see, one of the first of that great series of works beginning with Trendelenburg, Ueberweg, and Mill whose object was to new-model logic, and to bring it into living relation with the scientific wants of the time. We shall review here Professor Sigwart's conception of the scope and purpose of logic and then present a résumé of his idea of methodology.

One of the chief and most imperative prerequisites of successful conduct in life is the possession of principles that are certain and universal. Hence the need of reflexion upon the conditions under which this object can be attained, and consequently of determining the rules by following which it can be attained. This is the problem of logic ; if it were solved we should have *a true art of thought*.

The nature of thought is primarily a subject of psychology. But the foundations, here, are mooted questions. Language affords us the best foothold. In this, thought is essentially presentative activity : either involuntary, such as that which makes up the ordinary routine of life, or voluntary, willed, presentative activity, the purpose of which is the pursuit and satisfaction of the needs of life, in the widest sense of that expression. Here we are. We find ourselves surrounded by facts, circumstances, laws, with definite purposes to be realised. How are we to determine whether the thought which guides our conduct will, when executed, accomplish our purposes? Solely by our awareness of the necessity of our thought, or in other words by its logical structure.

Necessity of thought here, is not to be interpreted as *psychological* necessity, but is to be conceived as a necessity which is rooted in the contents and object of thought itself, in the nature of the objects that are thought: this is what we mean when we speak of the objectivity of thought.

Again, in the connexion of logic with ontology, it is exactly the same attributes which express the object of thought when this serves the purpose of reaching a knowledge of existence. Here, too, the aim at which purposive thought strives must be stated as a consciousness of its necessity and universality. Ordinarily we assume the existence of an independent objective world by a kind of psychological constraint, the knowledge of which is the object of thought. But this conclusion is always found on analysis to be an act of inference resting in the necessity of our thought; outside of thought there is no means of knowing whether we have reached this object; agreement of thought with fact is therefore necessity of thought; and necessity of thought in all minds, with respect to the same object, is universal thought. If the possibility of a knowledge of the world as it is in itself be denied, if being is only one of the thoughts that we produce, the fact yet remains undisputed that we attribute objectivity to the ideas which we produce with the consciousness of necessity, and that as soon as we posit a thing as existing we declare by implication that all other thinking beings of the same nature must produce it with the same necessity. This means that if we produce only necessary and universal thought, the knowledge of existence is implied in that thought. This conception exhausts the nature of "truth." Whether we speak of mathematical, objective, or moral truths, the common character of that which we denominate is, that it is a necessary and universal product of thought. We thus avoid the difficulties involved in the assumption of any special theory of knowledge as a foundation of logic.

Now, all thought which seeks to become conscious of its necessity and universality is accomplished in judgments expressed as statements or sentences; judgments are the goal of all practical reflexion, of all knowledge, the final form of all conviction; all else are conditions and preliminaries of judgment. But error and contention show that our practical thought often fails of its purpose, the judgments in which it is stated being in part rejected by ourselves and in part by others. Hence the necessity of a discipline which will teach us how to avoid error and controversy, and to execute our operations of thought so that the judgments which proceed therefrom shall be true, that is, necessary and certain, and that is, again, accompanied by a consciousness of their necessity, and, therefore, universal. Here, the logical and psychological consideration of thought are distinguished. Psychology seeks to exhibit to us the natural history of thought; the opposition of true and false has no place in it. But logic presupposes the purposive thinking of truth. In this aim it sets up the criteria of the thinking of truth, and on the other hand supplies instructions for so conducting thought that the truth shall be reached.

Logic is thus in one aspect a critical discipline of completed thought, and in the other aspect an art of thought. But again, as all criticism is of value only in so far as it is a means to attain an end, the highest and most important task of logic, and that which constitutes its real nature is its office as an art.

With respect to the scope of logic it is to be stated that this science assures us only of the formal correctness of the processes of thought and not of their material truth. With respect to the postulate of logic, the possibility of setting up criteria and rules of necessary and universal mental progress, rests upon the ability of distinguishing objectively necessary thought from non-necessary thought, and this ability is manifested in the immediate consciousness of the evidence which accompanies necessary thought; the experience of this consciousness and the belief in its trustworthiness is a postulate behind which we cannot go. The criterion which distinguishes necessary and universal judgment from false individual judgment is in the end our subjective feeling of necessity, our consciousness that with the given assumptions we *cannot* think differently from what we do.

These considerations determine Professor Sigwart's method of treatment. First, the nature of the function must be investigated for which the rules are to be sought; secondly, the conditions and laws of its normal operation must be determined; and finally, the rules of procedure are to be discovered by means of which from the incomplete condition of natural thought on the basis of given assumptions and means the perfect condition can be reached. The investigation is, therefore, divided into an analytical part, a normative part, and a technical part. The first two parts make up Volume One. Volume Two, of considerably greater extent, constitutes the technical part, being methodology.

The office of methodology is to supply the directions according to which from a given state of mind and knowledge by the use of the mental powers at our control, the object can be fully reached which human thought has set itself, and when we say fully we mean, by fully determined concepts and fully established judgments. Absolute certitude of notions and conscious verification of judgments are the two essential features of the ideal condition at which our thought aims. The question, how this ideal state can be reached with the means at our command is the object of the doctrine of methods.

In the second, the normative part of the work, the necessity was emphasised of searching for the simple elements of concepts and of determining the forms of their synthesis, so that we could have the conviction that the simplest elements of concepts were thought by all in the same manner, and that they were competent to determine fully every object of thought by unequivocal mental attributes. In the second place, in laying the foundations of judgments, it was found necessary to have full consciousness of those judgments which carry their justification in themselves; which necessitated the search for axioms. Hence result the following two inquiries, as determinative of the form of methodology, namely: (1) the procedure by which it is possible so to fix the collective simple elements of all the contents of the mind that we can be sure of their agreement in all thinking persons, and can determine the forms of their synthesis so that they can be combined in a concordant manner into composite concepts by all rational beings; (2) the procedure by which it is possible to acquire a clear consciousness of the ultimate assumptions of all judgment, upon which all justification of judgments not immediately evident depends, and by which we can establish the justification of every single judgment in a universally cogent manner.

More especially, the form of methodology is dependent on the nature of the conditions of fact in which the thought stands that it proposes to regulate, and on the other hand on the contents of the purpose which our purposive thought sets itself. This purpose is in part the knowledge of the world, as accessible to perception, and in part the establishment of the ultimate aims of practical volition. The ideal knowledge of the world involves a complete picture of the world in space and time, a classification of the facts of reality, an insight into the necessity of the facts of reality in the form of absolute causal connexion. Reflexion on the aims of practical volition finds its consummation in the setting up of a highest purpose which embraces all individual acts, and in the insight that that purpose must be unconditionally willed.

It will be readily seen that the inquiries set involve a consideration of the history of science, and as the first and most essential foundation the analysis of all our notions into the simplest elements, with their resultant manifold syntheses constructed according to fixed rigid rules. How these two principles lead to the examination of the fundamental notions of mathematics, psychology, etc., is evident, as is also the manner in which they must be grouped in such a consideration.

A very interesting addition to the second edition is a discussion of the notion of effect appended to the section of that name, treating of causality, where Wundt's notions of substantial and actual causality are very clearly criticised. A feature of the second part, also, is Sigwart's *special* discussion of the methodological premises of psychology.

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Coming to Wundt, some idea of this author's conception of the scope and purpose of logic will be given, as best characterising the work. Although we should not accept to-day, says Wundt, Kant's dictum of the stability of logic, nor ascribe any real value to the artifices of the scholastic syllogistics, much less regard thought as a simple mechanism of subsumption, it is yet customary with most authors, despite this belief, to start from the old traditions. By their adherence to these old forms, however, they unwittingly hamper themselves, for the Aristotelian logic, though it is useless as an organon of truth, is still not incorrect. Wundt, therefore, in his investigation begins anew and draws his material, not from tradition, but from the living testimonies of thought in language, and from those assured and successful methods of acquiring knowledge actually used in scientific research. Only in so far as historical elucidation is necessary is the traditional side of logic regarded in his treatment.

Logic, according to Wundt, must give account of the laws of thought which are active in the quest of truth. Logic is made thus to assume a place between psychology, the general science of mind, and the remaining theoretical sciences. Psychology teaches us how the course of thought is actually accomplished; logic determines how the course of thought must be accomplished in order to lead to correct results. Whilst the individual sciences seek to ascertain the facts of their respective provinces, logic seeks out the universal rules for the methods of thought applied in those researches; it is thus a normative science. The problems of logic refer us back on the one hand to psychological inquiries, and on the other they carry us forward to the universal principles of knowledge and the modes of procedure of scientific inquiry. If the laws of logical thought are not to be accepted as inexplicable facts, their origin must be sought for in our subjective experience. Further, if these laws are to subserve the purposes of the quest of truth, the ground of their evidence must be examined and the conditions ascertained under which their application leads to actual knowledge. Finally, if logic is to assist the theoretical sciences, it must trace out the complicated forms which the logical laws take on in the actual methods of scientific research. Besides the expression of the logical norms Wundt, therefore, demands of scientific logic three things: a history of the psychological genesis of thought; an investigation of the foundations and conditions of knowledge; and an analysis of the logical methods of scientific research. To sum up, logic requires epistemology for its foundation and methodology for its completion.

After his short review of the forms which logic assumes in the hands of the great philosophers, which may be classified under the general heads of formal logic and metaphysical or dialectic logic, Wundt discusses the relations of logic to philosophy in somewhat the following terms. Formal logic is declared by its representatives to be the universal propædeutic of philosophy, and to be exempt from the dispute which hovers over all philosophical questions. But this advantage is obtained at the cost of its scientific character. Even if that were the main office of logic it would still fail of its purpose, for sceptics and dogmatists have frequently enough disputed the certainty of the logical norms as being simply empirical rules, and rationalists and empiricists have not infrequently accorded in the statement that those logical norms were worthless, as at best they simply taught how existing knowledge was to be ordered, and not how it was to be acquired. On the other hand, whilst formal logic placed itself outside of philosophy, the metaphysical logic pretended to be philosophy itself. It was an organon of thought in the fullest sense of the word, for its instrument created its subject-matter. By the principle of the identity of thought and being, logical thought developed by its own spontaneous movement the connexion of ideas: logic became metaphysics, which in its turn embraces all other philosophical disciplines as dependent provinces. Scientific logic finally regards itself as a branch of philosophy, for philosophy seeks to resolve the problems which are common to the individual sciences. And these problems are of two kinds. They refer partly to the general content of knowledge, partly to its foundations and to the norms of its development. With the content of knowledge metaphysics busies itself. She expounds this content in general notions about being and in laws concerning its relations. Such notions and laws are, it is true, developed by the experimental sciences, and only subsequently handed over by them to philosophy, which subjects them to a final elaboration in order to bring the single facts and hypotheses in harmony with one another and with the general principles of cognition, and to complete them finally by means of further suppositions which are demanded by the connexion of the different provinces of experience. The aim of metaphysics, thus, is the creation of a consistent view of the world which will put all isolated knowledge into solid interconnexion.

As it is the office of metaphysics to present developed knowledge, so it is the office of logic to present developing knowledge, with the methods that lead to it and the means which human thought employs. The theory of knowledge might be given an independent middle place between logic and metaphysics as that discipline which is to investigate the content and not the methods of knowledge or its foundations and its limits. But with the establishment of this task the theory of knowledge is put into the most intimate relation with logic. For one of its principal tasks must be to examine with respect to their origin and certainty the logical norms and methods themselves. Logic, therefore, cannot dispense with the aid of epistemological inquiries. Similarly the fundamental notions and laws of scientific cognition stand in close relation to the general laws of thought, and here again the more complicated logical methods presuppose throughout principles which, like the notion of substance or the laws of causality, for example, are proper subjects of epistemological investigation. On these grounds it appears impracticable to separate from each other in an exposition of this subject the provinces of epistemology and scientific logic.

Assigning to logic, therefore, this more general significance, logic and metaphysics are the two halves of theoretic philosophy. But logic is that half which stands in more intimate relation with the single sciences. With metaphysics this relation is a one-sided one. She is compelled to learn from empirical research, whilst the latter in its collection of facts and in the development of provisional hypotheses need take no account of metaphysical requirements. With logic, on the other hand, the relation is throughout a reciprocal one. From the modes of mental procedure and of research as actually practised, logic abstracts its general results; afterwards, however, it hands over these general results to the individual sciences as binding norms, to which at the same time it adds rigorous conclusions with respect to the certainty and the limits of cognition which, if it neglect, special research will be easily led away from its assured foundations to end up in groundless doubts or in crude metaphysics.

With this the substance and the differences of the two systems are sufficiently emphasised, to admit of comparisons, which the reader may draw for himself.

T. J. McC.

THE PSYCHIC FACTORS OF CIVILISATION. By *Lester F. Ward.* Boston : Ginn & Co. 1893. Price, $2.00. Pages, 369.

This work is intended as a contribution to both psychology and sociology, and attempts to place "over against the purely physiological economy" a psychological economy. "For," says the author, "human society which is the highest product "of evolution, naturally depends upon mind which is the highest property of mat-"ter" (p. 3).

Mind is possessed of two sides, viz., of feelings and emotions, or the subjective side, and of the intellect, or the objective side. Thus the work naturally divides itself into three parts : (1) the subjective factors, (2) the objective factors, and (3) the social synthesis of the factors. The first part undertakes to show that the true forces of society are psychic ; the second part explains the directive agent controlling the social forces, which is also psychic, being the objective side of mind or thought. The third part points out how the social forces, under the control of the directive agent, have established society.

This in great outlines is the plan of the work, which is clear and recommendable ; but the reader is confronted with difficulties as soon as he enters into the details of the exposition, and we must confess that in glancing through this book we are more than ever impressed with the desirability of having in psychology definite and commonly accepted terms. The terms "psychic" and "mental" may mean the same, or they may not. Emotions and feelings on the one side, and intellect on the other, are represented as "the obverse and reverse of the same coin." Yet is intellect said to "embrace the entire thinking part of the mind, all of mind that "is not feeling" (p. 225). That which constitutes the nature of thought is not the feeling element of thought ; nevertheless, there can be no thought which is not at the same time feeling. Mr. Ward says, "The common expression, unconscious, feeling,' is a "contradiction of terms"; yet he classifies sensations into (1) "pleasurable and painful," (2) "conscious and unconscious" (p. 125). Are not "sensations" included under the head of "feelings," and if there are no unconscious feelings, how can there be unconscious sensations? We should say that "consciousness" is a peculiarly intensified state of feeling and have no objection to speaking of subconscious or dim and even unconscious feelings.

Emotions are characterised as "secondary sensations"; they are "reflected "from the brain along special nerve-fibres to certain specialised emotional ganglia "within the organism," and are said to have their seat in the sympathetic system—a theory that is scarcely tenable on physiological grounds. Schopenhauer, who in spite of his genius was not free from certain metaphysical and telepathic supersti-